

Awareness On Platform Switching In Implants Among Dental Students

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ABSTRACT :

INTRODUCTION : Platform switching is a relatively new idea in implant dentistry for minimising circumferential bone loss around dental implants by managing postrestorative crestal bone levels. The platform swapping idea entails the use of prosthetic components with a platform diameter that is smaller than the implant platform diameter.

AIM: The aim of this study is to assess the level of awareness on platform switching in implants among dental students.

MATERIALS AND METHODS : A set of 11 questions were formulated as a questionnaire and distributed among the study. The participants were asked to fill the questionnaire. The survey was done in an online forum. A total of 150 validated entries were collected. Data was entered into Microsoft Excel 2007 and analysed in SPSS V20. Associations between categorical variables were determined using Chi-square. $P < 0.05$ was considered statistically significant.

RESULTS : 33 out of 40 PG students think that platform switching approach should be applied clinically for the overall success of dental implants. 25 out of 40 PG students were agreeing that platform switching in implant reduces crestal bone loss. 64% of the participants think that platform switching in implant reduces crestal bone loss thereby increasing implant longevity.

CONCLUSION : Majority of the post graduate students were aware of platform switching in implant but most of the undergraduate students were not aware and not sure of platform switching and their benefits in implant. Thus knowledge and awareness on platform switching in implants should be established among undergraduate dental students

KEYWORDS : Awareness ; Implant ; Novel method ; Platform switching ; Innovation

INTRODUCTION :

Modern dentistry's purpose is to offer patients with good oral health in a predictable manner. With a typical detachable prosthesis, the partially or totally edentulous patient may not have proper masticatory function, good aesthetics, or phonation. When a patient wears a removable denture, their masticatory capacity is usually reduced to one-sixth of what it was when they had natural teeth[1]. An optimal implant prosthesis can improve masticatory function by restoring normal muscle action. The presence of sufficient amount and quality of bone around the implants is the most crucial criterion for their success. The ability of dental implants to last is greatly reliant on the integration of implant components with oral tissues[2]. If bone loss around the implant is less than 2 mm during the first year of use, the implant is considered effective. Platform switching (PLS) is a technique used in implant dentistry to preserve alveolar bone levels surrounding dental implants. The notion refers to using a narrower diameter restorative abutment on a broader diameter implant rather than using abutments of equal dimensions, which is known as platform matching (PLM). Platform switching is a relatively recent approach in implant dentistry for reducing circumferential bone loss around dental implants by managing post-restorative crestal bone levels. The platform swapping idea entails the use of prosthetic components with a platform diameter that is smaller than the implant platform diameter. The prosthetic connection is moved horizontally inwards from the implant platform's perimeter in this manner, resulting in an angle, or step, between the abutment and implant. The mechanism by which this stepped effect contributes to the maintenance of marginal bone height and horizontal dimension of the step allows for an additional area where biologic attachment can occur, limiting the amount of physiologic remodelling of the bone crest required to accommodate the biologic zone.

The overall success of a dental implant is determined on the quantity and quality of bone surrounding the implants, particularly the crestal bone. Early peri-implant bone loss, on the other hand, is a common occurrence. The first to quantify marginal bone loss during the first year of prosthetic loading was Adell et al.[3]. Initial crestal bone loss leads to increased bacterial accumulation and secondary peri-implantitis, which can lead to a loss of bone support, occlusal loading, and crestal bone loss, all of which can lead to implant failure. Marginal bone loss changes gingival outlines, which leads to the disappearance of the interproximal papilla [4].

After one year of loading, Albrektsson et al.[3] [5] discovered that the implantation of two-piece implants healing in a submerged mode resulted in crestal bone loss of 1.5–2.0 mm. Furthermore, crestal bone remodelling with a resorption of 2 mm has been confirmed in experimental tests in dogs [5]. As a result, clinicians, academics, and implant firms have devoted time to figuring out how to prevent crestal bone loss after abutment attachment. The agreement at the Toronto Conference [6] on bone loss around the implant was that up to 2 mm of bone loss during the first year of implant function is acceptable, and the implant is considered effective at this level.

Many studies have been published to determine the reasons for bone loss surrounding implants as well as clinical treatments to prevent it.

According to some published research, the platform switching (PLS) approach, which involves placing an abutment one size smaller than the implant platform to avoid bone loss surrounding the implant, is effective [7][8]. The perimeter of the implant-abutment junction (IAJ) is shifted inward toward the implant's central axis when this connection is made. Repositioning the outer edge of the implant-abutment interface horizontally inward and away from the outside edge of the implant platform can reduce crestal bone loss. Our team has extensive knowledge and research experience that has translate into high quality publications[9–20]. The aim of this study is to assess the level of awareness on platform switching in implants among dental students .

MATERIALS AND METHODS :

We had prepared a questionnaire to evaluate the awareness on platform switching in implants among dental students .The questionnaires were distributed to a total of 150 participants. A set of 11 questionnaires was formulated and distributed among the study participants. The participants were asked to fill the questionnaire . The survey was done in an online forum. A total of 100 validated entries were collected. Data was entered into Microsoft Excel 2007 and analysed in SPSS V20. Associations between categorical variables were determined using Chi-square test. $P < 0.05$ was considered statistically significant.

RESULTS :

33 out of 40 PG students think that platform switching approach should be applied clinically for the overall success of dental implants. 25 out of 40 PG students were agreeing that platform switching in implant reduces crestal bone loss . 64 % of the participants thinks that

platform switching in implant reduces crestal bone loss thereby increasing implant longevity.

The comparison of educational qualification of the participants and awareness about platform switching in implants shows that the majority of the UG students have less awareness and the majority of the PG students have more knowledge and awareness on platform switching in implants [Figure 1]. The comparison of educational qualification and clinical application of platform switching for the overall success of dental implants shows that the majority of UG as well as PG students are agreeing that clinical application of platform switching for the overall success of dental implants [Figure 2]. The comparison of educational qualification of the participants and level of agreement of the participants that platform switching in implant reduces crestal bone loss shows that majority of the UG and PG students have a partial level of agreement that platform switching in implant reduces crestal bone loss [Figure 3]. The comparison of platform switching to increase implant longevity and agreement of participants on platform switching reduces crestal bone loss shows majority agreeing that platform switching in implant increases implant longevity and reduces crestal bone loss [Figure 4].

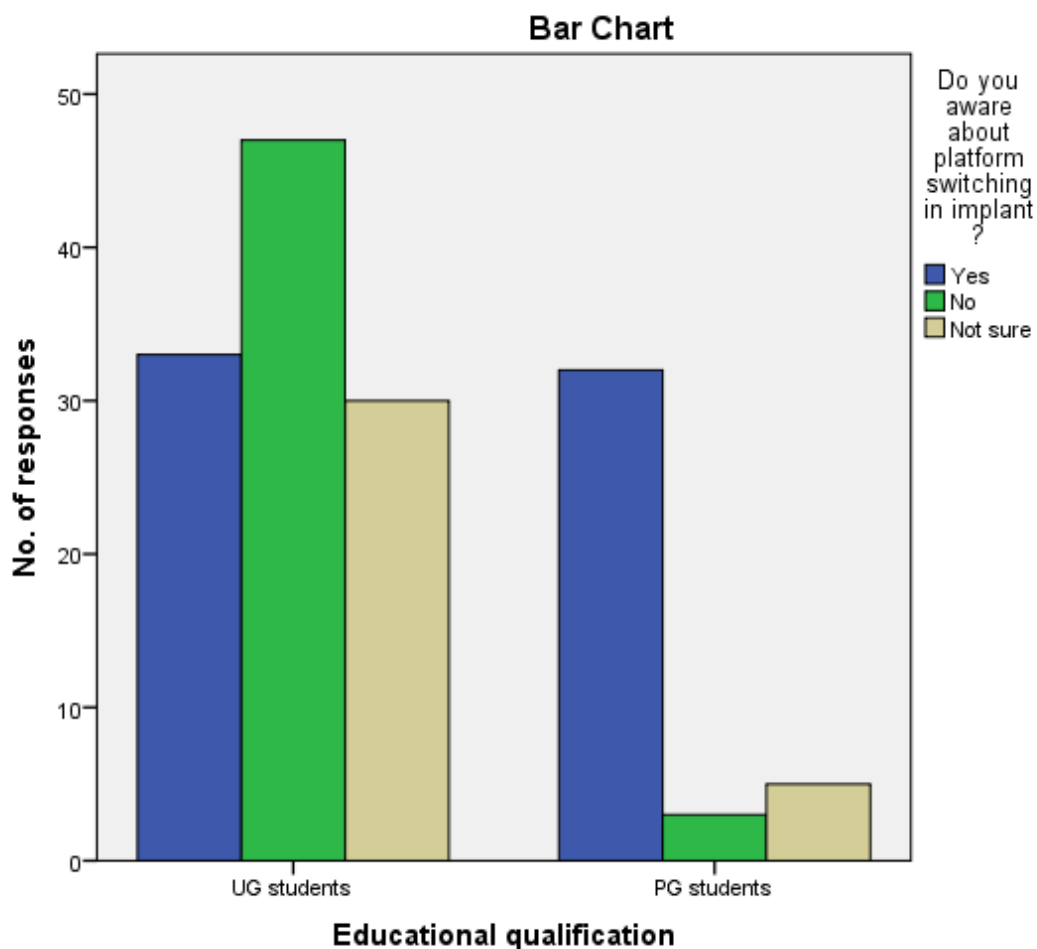


FIGURE 1 : The bar graph represents the comparison of educational qualification and awareness about platform switching in implant . The horizontal axis represents the Educational qualification of the participants and the vertical axis represents the level of awareness on platform switching.

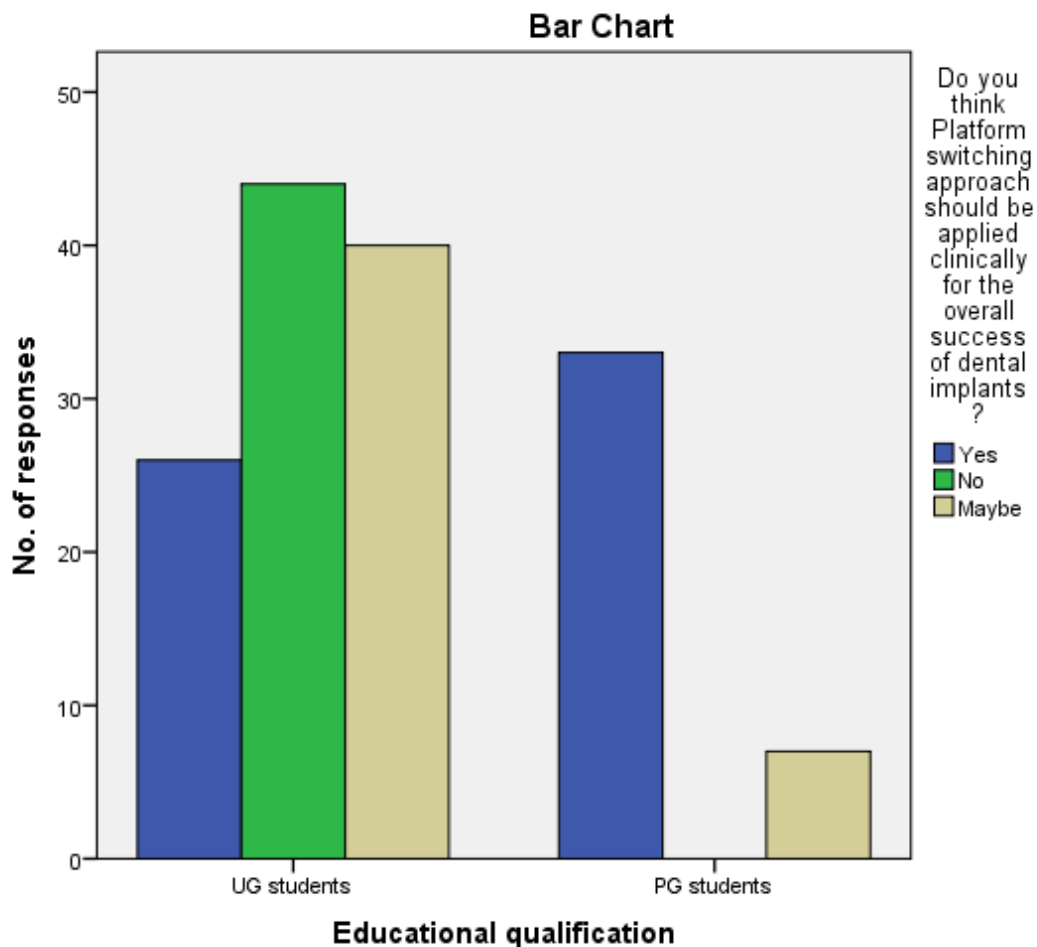


FIGURE 2 : The bar graph represents the comparison of educational qualification and clinical application of platform switching for the overall success of dental implants. The horizontal axis represents the educational qualification of the participants and the vertical axis represents the clinical application of platform switching for the overall success of dental implants.

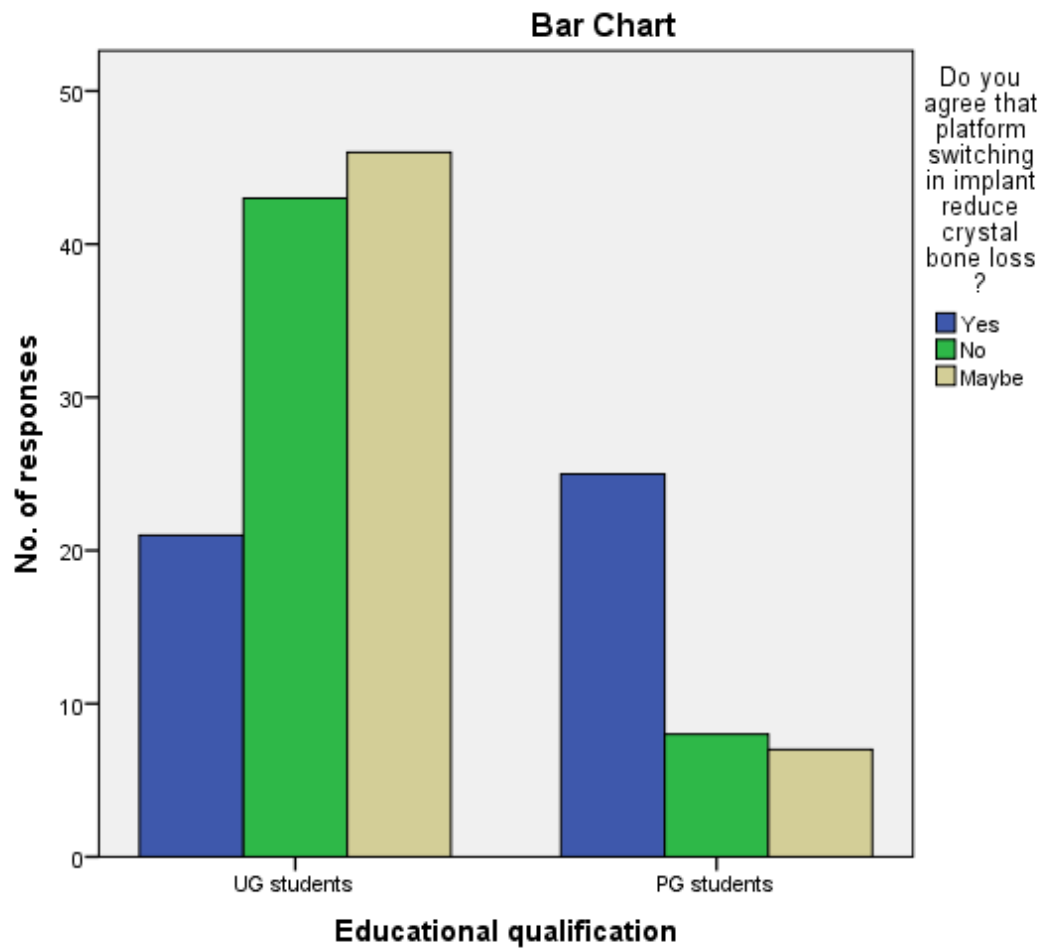


FIGURE 3 : The bar graph represents the comparison of educational qualification of the participants and level of agreement of the participants that platform switching in implant reduces crestal bone loss.

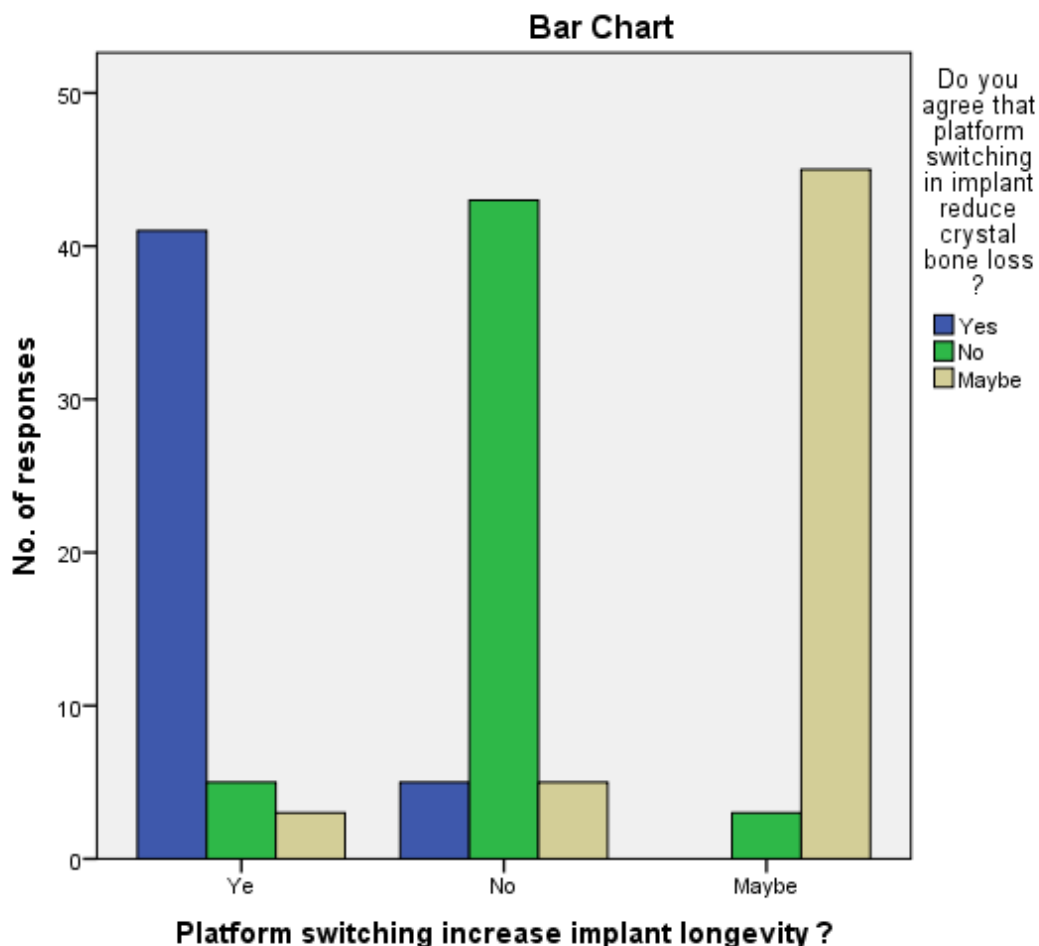


FIGURE 4 : The bar graph represents the comparison of platform switching to increase implant longevity and agreement of participants on platform switching reduces crestal bone loss . The horizontal axis represents the agreement of participants on platform switching increase implant longevity and the vertical axis represents the agreement of participants on platform switching in implants reduces crestal bone loss

DISCUSSION :

PLS has been discussed in a number of articles, including case studies and original research [21–26]. The peri-implant crestal bone and superior soft-tissue conditions around PLS implants were preserved in these case studies and some clinical findings. However, scientific proof for the biological mechanism by which this is accomplished is lacking. The causal link and method of crestal bone resorption prevention around PLS implants must be clarified. For support and long-lasting, optimum, and stable gingival

contours, a specific level of solid bone surrounding the implant neck is required. In clinical settings, incorporating the PLS idea into implant treatment and having a good grasp of biologic width helps to preserve crestal bone. According to Ericsson et al.[27], bone is usually surrounded by around 1 mm of healthy connective tissue, therefore crestal bone remodelling occurs to generate space between the bone and inflammatory cell tissue (ICT) in order to form a biological seal. The use of a smaller diameter abutment on a larger diameter implant collar is referred to as PLS. The perimeter of the IAJ is shifted inward toward the implant's core axis using this form of connection. Shifting the IAJ inward, according to Lazzara and Porter [8] similarly changes the inflammatory cell infiltrate inward and away from the crestal bone. It was demonstrated in the current study that implants restored according to the PLS concept experienced much less marginal bone loss than implants with matching implant abutment diameters over a period of roughly a year. PLS is a key contributor factor in preventing crestal bone resorption, according to a review of the existing evidence. To keep the soft and hard tissues healthy, a certain amount of biological width is required. The IAJ is pushed inward in PLS. This will not only move the inflammatory infiltrate away from the crestal bone, but it will also give more horizontal biological width, maintaining the crestal bone.

The microgap is also relocated away from the crestal bone, reducing the likelihood of resorption[28] The localised inflammation of the peri-implant soft tissue was thought to be the cause of bone remodelling[29]. This viewpoint was backed up by the microgap at the IAJ inflammatory cell infiltrate of the abutment, where bacterial infiltration can always be detected, as reported by Jansen et al. [30] This infiltrate was about 0.5–0.75 mm coronal to the IAJ and 0.5–0.75 mm apical to the IAJ in length. The ICT never made contact with the bone; instead, it was isolated from it by a 1 mm thick layer of healthy connective tissue. The PLS idea, which refers to the use of a smaller diameter abutment on a larger diameter implant platform, is a contemporary method aimed at limiting or reducing the horizontal component of bone loss. The IAJ's perimeter is shifted inward toward the implant's central axis as a result of this connection, which protects marginal bone from stress concentration. Inward migration of IAJ is also thought to shift inflammatory cell infiltration to the central axis of the implant and away from the neighbouring crestal bone, limiting crestal bone resorption. Furthermore, the abutment collar length, which regulates the final crown margin position and the aesthetic outcome, influences crestal bone loss and soft tissue stability [8, 31].

All studies that compared platform-switched and non platform-switched implants found that platform-switched implants cause reduced marginal bone resorption. Implant-abutment interface is a very important criterion for implant success. PLS lengthens the distance between IAJ and the crestal bone, increasing the microgap to crestal bone distance and so conserving the crestal bone, but it has no effect on the microgap width. In Morse taper or internal hex implants, precision fit of the implant-abutment connection provides an additional benefit of minimised microgap. As a result, the introduction of a Morse taper connection combined with PLS could be a benefit to implant dentistry. Peri-implant probing around the implant, according to one study, is a good predictor of crestal bone loss [32]. There is also scientific evidence of a link between the levels of the bone at the time of probing penetration [32, 33].

CONCLUSION :

Majority of the post graduate students were aware of platform switching in implant but most of the undergraduate students were not aware and not sure of platform switching and their benefits in implant. Thus knowledge and awareness on platform switching in implants should be further established among undergraduate dental students

ACKNOWLEDGEMENT :

The authors would like to acknowledge the support rendered by the Department of Prosthodontics & Saveetha dental college and hospitals and the management.

AUTHOR CONTRIBUTION:

All the authors contributed equally to the study

SOURCE OF FUNDING :

The present project is supported/funded/sponsored by

- Saveetha Institute of Medical and Technical Sciences ,
- Saveetha Dental College and Hospitals , Saveetha University
- Kumaran TV center and Furnitures ,Attur , Salem.

CONFLICT OF INTEREST :

The author have no conflict of interest

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